



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,265	01/14/2002	Leslie Michael Lea	WLJ.056CIP	5387

20987 7590 01/11/2005

VOLENTINE FRANCOS, & WHITT PLLC
ONE FREEDOM SQUARE
11951 FREEDOM DRIVE SUITE 1260
RESTON, VA 20190

EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
----------	--------------

1763

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/043,265

Applicant(s)

LEA ET AL.

Examiner

Luz L. Alejandro

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 12-20, 22 and 24-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 21 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities: numerous grammatical errors exist in the specification, for example, the words "utilized", "energized", "utilizing", "utilize", "localized", homogenizing", or "optimization" have been misspelled in numerous parts of the specification.

Appropriate correction is required. A substitute specification in proper idiomatic English and in compliance with 37 CFR 1.52(a) and (b) is required. The substitute specification filed must be accompanied by a statement that it contains no new matter.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

Claims 1-11 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitation "wherein the magnetic field production device is positioned to act on the first chamber either adjacent to the first chamber or between the first and second chambers" is confusing since it is not clear if applicant is trying to claim that the magnetic field device is positioned either adjacent to the first chamber or between the

first and second chambers, or if applicant is trying to claim that the magnetic field production device act on the first chamber either adjacent to the first chamber or between the first and second chambers.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 6-7, 9-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Campbell et al., U.S. Patent 4,990,229.

Campbell et al. shows the invention as claimed including a plasma processing apparatus comprising a first chamber 31 provided with a plasma inducing device 32 designed to produce a plasma in the first chamber, a second chamber 35 into which plasma so produced can diffuse to act upon a workpiece 38 being processed, and a magnetic field production device 33, 34, 36 which is separate from the plasma inducing device, wherein the magnetic field production device is positioned to act on the first chamber either adjacent to the first chamber or between the first and second chambers. It should be noted that attenuation of the ions which diffuse into the second chamber and approach the workpiece, by directing a proportion of the ions to a loss surface of either chamber will be produced.

Regarding claims 3, 6-7, 9-11, note that the magnetic field production device 33 comprises a solenoid installed around the side wall of the first chamber, the reference discloses the magnetic field production device 34, the apparatus incorporates a ring gas feed 44 within the second chamber, below the junction point of the two chambers, in addition to a gas feed inlet 41 to the top of the first chamber, the second chamber is provided with a magnetic bucket arrangement created by an array of magnets 36 around the chamber wall; wherein the first chamber geometry is form as a cylinder, the first chamber is of annular form and the annular magnetic field production device comprises separate solenoids 33/34 located both within and around the annulus.

Claims 1, 3, 7-8 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Maeda et al., EP 0676793 A2.

Maeda et al. shows the invention as claimed including a plasma processing apparatus comprising a first chamber 1 provided with a plasma inducing device 2 designed to produce a plasma in the first chamber, a second chamber 7 into which plasma so produced can diffuse to act upon a workpiece 20 being processed, and a magnetic field production device 5, 6, 10 which is separate from the plasma inducing device, wherein the magnetic field production device is positioned to act on the first chamber wither adjacent to the first chamber or between the first and second chambers. It should be noted that attenuation of the ions which diffuse into the second chamber and approach the workpiece, by directing a proportion of the ions to a loss surface of either chamber will be produced.

Regarding claims 3, 7-8, 10, note that the magnetic field production device 5/6 comprises a solenoid installed around the side wall of the first chamber, the apparatus incorporates a ring gas feed 9a within the second chamber and below the junction point of the two chambers, in addition to a gas feed inlet 8 to the top of the first chamber, wherein a solenoid device is provided for the second chamber, wherein the first chamber geometry is form as a cylinder.

Claims 1, 2, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Boswell, U.S. Patent 4,810,935

Boswell shows the invention as claimed including a plasma processing apparatus comprising a first chamber 10 provided with a plasma inducing device 32 designed to produce a plasma in the first chamber, a second chamber 20 into which plasma so produced can diffuse to act upon a workpiece 17 being processed, a magnetic field production device 13/16 which is separate from the plasma inducing device, wherein the magnetic field production device is positioned to act on the first chamber either adjacent to the first chamber or between the first and second chambers, and a gas feed inlet 19 in the top of the first chamber. It should be noted that attenuation of the ions which diffuse into the second chamber and approach the workpiece, by directing a proportion of the ions to a loss surface of either chamber will be produced.

Regarding claims 2 and 10, note that the magnetic field production device 13 comprises an electromagnet installed around the side wall of the first chamber, wherein the first chamber geometry is form as a cylinder.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Campbell et al., U.S. Patent 4,990,229 in view of Yokota, JP 7-153594.

Campbell et al. is applied as above but does not expressly disclose either the use of permanent magnets or electromagnets installed around the side wall of the first chamber or a solenoid device provided for the second chamber. Yokota discloses that permanent magnets, electromagnets and solenoids are known and suitable means that can be used for generating magnetic field in a plasma apparatus (see, for example, the abstract). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the

Art Unit: 1763

apparatus of Campbell et al. as to use permanent magnets or electromagnets as the magnetic field production device around the side wall of the first chamber or to provide a solenoid device for the second chamber as the magnetic field production device because such magnetic field generating means are known to be equivalent and suitable for generating magnetic field.

Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Campbell et al., U.S. Patent 4,990,229 in view of Takagi, U.S. Patent 5,681,393 or Ishii, U.S. Patent 5,529,657.

Campbell et al. is applied as above but does not expressly disclose that the apparatus comprises an additional plasma inducing device at the upper region of the second chamber. Takagi discloses an apparatus in which two plasma inducing devices 521a in order to reduced the undesirable sputtering action in the discharge chamber (see fig. 20 and its description). Additionally, Ishii discloses an apparatus in which plasma inducing devices 7a/7b/7c are used to generate a high density uniform plasma having a desired density distribution (see, for example, fig. 13 and its description). Therefore, in view of these disclosures, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Campbell et al. as to further comprise an additional plasma inducing device at the upper region of the second chamber in order to reduce the undesirable sputtering action in the discharge chamber and in order to generate a high density uniform plasma having a desired density distribution.

Claims 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Campbell et al., U.S. Patent 4,990,229 in view of Wicker et al., U.S. Patent 5,863,376.

Campbell et al. is applied as above and further discloses that the first chamber incorporates a dielectric plasma tube, however it does not disclose that the dielectric tube is formed of aluminum nitride or silicon carbide. Wicker et al. discloses an apparatus in which a chamber comprises a high thermal conductivity dielectric material formed of aluminum nitride in order to maximize heat transfer from the antenna (see col. 6, lines 21-27). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Campbell et al. as to comprise a plasma tube formed of aluminum nitride because such material is known to be a high thermal conductivity dielectric material which will maximize the heat transfer from the antenna.

Claims 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al., EP 0676793 A2 in view of Yokota, JP 7-153594.

Maeda et al. is applied as above but does not expressly disclose the use of permanent magnets or electromagnets installed around the side wall of the first chamber. Yokota discloses that permanent magnets, electromagnets and solenoids are known and suitable means that can be used for generating magnetic field in a plasma apparatus (see, for example, the abstract). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention

was made to modify the apparatus of Maeda et al. as to use permanent magnets or electromagnets as the magnetic field production device around the side wall of the first chamber because such magnetic field generating means are known to be equivalent and suitable for generating magnetic field.

Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al., EP 0676793 A2 in view of Takagi, U.S. Patent 5,681,393 or Ishii, U.S. Patent 5,529,657.

Maeda et al. is applied as above but does not expressly disclose that the apparatus comprises an additional plasma inducing device at the upper region of the second chamber. Takagi discloses an apparatus in which two plasma inducing devices 521a in order to reduced the undesirable sputtering action in the discharge chamber (see fig. 20 and its description). Additionally, Ishii discloses an apparatus in which plasma inducing devices 7a/7b/7c are used to generate a high density uniform plasma having a desired density distribution (see, for example, fig. 13 and its description). Therefore, in view of these disclosures, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Maeda et al. as to further comprise an additional plasma inducing device at the upper region of the second chamber in order to reduce the undesirable sputtering action in the discharge chamber and in order to generate a high density uniform plasma having a desired density distribution.

Claims 6, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al., EP 0676793 A2 in view of Campbell et al., U.S. Patent 4,990,229.

Maeda et al. is applied as above but does not expressly disclose that the magnetic field production device comprises a magnetic structure formed at the junction of the two chambers, the second chamber is provided with a magnetic bucket arrangement created by an array of magnets around the chamber wall, and the first chamber is of annular form and the annular magnetic field production device comprises separate permanent magnets, electromagnets or solenoids located both within and around the annulus. Campbell et al. discloses a plasma processing apparatus comprising a first chamber 31 provided with a plasma inducing device 32 designed to produce a plasma in the first chamber, a second chamber 35 into which plasma so produced can diffuse to act upon a workpiece 38 being processed, and a magnetic field production device 33, 34, 36 positioned relative to at least the first of the two chambers; wherein magnetic field production device 34 is formed at the junction of the two chambers, the second chamber is provided with a magnetic bucket arrangement created by an array of magnets 36 around the chamber wall, and the first chamber is of annular form and the annular magnetic field production device comprises separate solenoids 33/34 located both within and around the annulus (see fig. 9 and its description). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Maeda et al. as to comprise the claimed magnetic field generating structure in order to provide high uniform plasma over a large area.

Claims 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al., EP 0676793 A2 in view of Wicker et al., U.S. Patent 5,863,376.

Maeda et al. is applied as above and further discloses that the first chamber incorporates a dielectric plasma tube, however it does not disclose that the dielectric tube is formed of aluminum nitride or silicon carbide. Wicker et al. discloses an apparatus in which a chamber comprises a high thermal conductivity dielectric material formed of aluminum nitride in order to maximize heat transfer from the antenna (see col. 6, lines 21-27). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Maeda et al. as to comprise a plasma tube formed of aluminum nitride because such material is known to be a high thermal conductivity dielectric material which will maximize the heat transfer from the antenna.

Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boswell, U.S. Patent 4,810,935 in view of Yokota, JP 7-153594.

Boswell is applied as above but does not expressly disclose either the use of a solenoid around the first chamber or a solenoid device provided for the second chamber. Yokota discloses that permanent magnets, electromagnets and solenoids are known and suitable means that can be used for generating magnetic field in a plasma apparatus (see, for example, the abstract). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Boswell as to use a solenoid around the first

Art Unit: 1763

chamber or to provide a solenoid device for the second chamber as the magnetic field production device because such magnetic field generating means are known to be equivalent and suitable for generating magnetic field.

Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boswell, U.S. Patent 4,810,935 in view of Takagi, U.S. Patent 5,681,393 or Ishii, U.S. Patent 5,529,657.

Boswell is applied as above but does not expressly disclose that the apparatus comprises an additional plasma inducing device at the upper region of the second chamber. Takagi discloses an apparatus in which two plasma inducing devices 521a in order to reduced the undesirable sputtering action in the discharge chamber (see fig. 20 and its description). Additionally, Ishii discloses an apparatus in which plasma inducing devices 7a/7b/7c are used to generate a high density uniform plasma having a desired density distribution (see, for example, fig. 13 and its description). Therefore, in view of these disclosures, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Boswell as to further comprise an additional plasma inducing device at the upper region of the second chamber in order to reduce the undesirable sputtering action in the discharge chamber and in order to generate a high density uniform plasma having a desired density distribution.

Claims 6-7, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boswell, U.S. Patent 4,810,935 in view of Campbell et al., U.S. Patent 4,990,229.

Boswell is applied as above but does not expressly disclose that the magnetic field production device comprises a magnetic structure formed at the junction of the two chambers, the second chamber is provided with a magnetic bucket arrangement created by an array of magnets around the chamber wall, and the first chamber is of annular form and the annular magnetic field production device comprises separate permanent magnets, electromagnets or solenoids located both within and around the annulus. Campbell et al. discloses a plasma processing apparatus comprising a first chamber 31 provided with a plasma inducing device 32 designed to produce a plasma in the first chamber, a second chamber 35 into which plasma so produced can diffuse to act upon a workpiece 38 being processed, and a magnetic field production device 33, 34, 36 positioned relative to at least the first of the two chambers; wherein magnetic field production device 34 is formed at the junction of the two chambers, the second chamber is provided with a magnetic bucket arrangement created by an array of magnets 36 around the chamber wall, and the first chamber is of annular form and the annular magnetic field production device comprises separate solenoids 33/34 located both within and around the annulus (see fig. 9 and its description). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Boswell as to comprise the claimed magnetic field generating structure in order to provide high uniform plasma over a large area.

Additionally, Boswell does not expressly disclose a ring gas feed within the second chamber, below a junction point of the two chambers. Campbell et al. further discloses the use of ring gas feed 44 within the second chamber and below a junction point of the two chambers in order to direct a uniform flow of gas towards the substrate (see col. 8-line 67 to col. 9-line 1). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Boswell as to further comprise a ring gas feed within the second chamber, below a junction point of the two chambers, in order to direct a uniform flow of gas towards the substrate.

Claims 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boswell, U.S. Patent 4,810,935 in view of Wicker et al., U.S. Patent 5,863,376.

Boswell is applied as above and further discloses that the first chamber incorporates a dielectric plasma tube, however it does not disclose that the dielectric tube is formed of aluminum nitride or silicon carbide. Wicker et al. discloses an apparatus in which a chamber comprises a high thermal conductivity dielectric material formed of aluminum nitride in order to maximize heat transfer from the antenna (see col. 6, lines 21-27). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Boswell as to comprise a plasma tube formed of aluminum nitride because such material is known to be a high thermal conductivity dielectric material which will maximize the heat transfer from the antenna.

Response to Arguments

Applicant's arguments filed 10/26/04 have been fully considered but they are not persuasive.

Applicant argues that devices 33 and 34 of the apparatus of Campbell et al. reference, solenoids 5 and 6 of the apparatus of the Maeda et al. reference, and coil 13 of the apparatus of the Boswell reference, are part of the plasma inducing device and are not magnetic field production devices separate from the plasma inducing device. The examiner respectfully disagrees since antenna 32 of the apparatus of Campbell et al., antenna 2 of the apparatus of Maeda et al., and antenna 32 of the apparatus of Boswell are respectively the plasma inducing device. Campbell et al. in col. 8, lines 31-34, Maeda et al., in col. 5, lines 25-32, and Boswell in col. 4, lines 39-41, clearly disclose that devices 33 and 34, solenoids 5 and 6, and coil 13, respectively, are provided to generate a magnetic field.

Applicant argues that device 36 of Campbell et al. is outside of the scope of amended claim 1. The examiner respectfully disagrees and points out that independent claim 1 uses the "comprising" open language. Therefore, the invention does not limit the apparatus of the Campbell et al. reference as to not comprise other structures, such as the mentioned device 36.

Applicant argues the rejection of claim 23, however, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck &*

Art Unit: 1763

Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Furthermore, in response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the Wicker et al. reference clearly provides the motivation to use aluminum nitride as the dielectric material in the apparatuses of Campbell et al., Maeda et al. or Boswell, as clearly stated in the above and the previous rejections.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of


Art Unit: 1763

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 571-272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Luz L. Alejandro
Primary Examiner
Art Unit 1763

January 6, 2005